

REMARKS

A. Request for Reconsideration

Applicant has carefully considered the matters raised by the Examiner in the outstanding Office Action but remains of the position that patentable subject matter is present. Applicant respectfully requests reconsideration of the Examiner's position based on the certified English translation of the priority document JP 2003/079523, the amendments to the claims and the following remarks.

B. The Invention

The present invention is directed to a holographic recording medium having high sensitivity and high refractive index contrast, and methods of forming a holographic image using the holographic recording medium.

In one of the novel aspects of the invention, the holographic recording layer contains a binder, a polymerizable compound with an ethylenic double bond, a photo initiator, and a cross linking agent, wherein the photo initiator contains a compound represented by Formula (I).

In another novel aspect of the invention, the thickness of the holographic recording layer (Dh) is 200 μm to 2.0 mm.

C. Claim Status and Amendments

Claims 1-10 and 12-20 are presented for continued prosecution.

Claims 1, 18, and 20 have been amended to include the limitations of claim 11. Claim 11 has been canceled.

Claims 1, 18, and 20 have also been amended to recite that the binder compound is not reactive with the polymerizable compound and forms an in situ matrix. Support for this amendment can be found in par. 1 on page 40 and in par. 1 on page 41 of the application. This amendment was also requested by the Examiner.

D. Claim Rejections under 35 U.S.C. § 112

The Examiner rejected claims 1-20 as indefinite stating that the claims should recite that the binder is not reactive with the polymerizable compound and forms an in situ matrix. Applicant has amended claims 1, 18, and 20 to recite this limitation. It is therefore believed that the indefiniteness rejection is overcome.

E. The Application Priority Date is Prior to the Publication Date of Sasa

In some of the prior art rejections, Sasa (WO 2004/017141) had been cited to reject the claims.

Sasa is prior art under § 102(a) as of its February 26, 2004 publication date. The publication date of Sasa is after the March 24, 2003 Japanese priority date of the present application.

Applicant has enclosed a certified English translation of the Japanese priority document to perfect the claim of priority in order to remove Sasa as prior art. Support for the claims of the present application can be found in the following portions of the Japanese priority document:

U.S. App.	Priority Doc.	U.S. App.	Priority Doc.	U.S. App.	Priority Doc.	U.S. App.	Priority Doc.
claim 1	claim 1, claim 1, pars. 88 and 90	claim 6	claim 6	claim 12	claim 13	claim 17	claim 18
claim 2	2	claim 7	claim 7	claim 13	claim 14	claim 18	claim 19, claim 11, pars. 88 and 90
claim 3	3	claim 8	claim 8	claim 14	claim 15	claim 19	claim 20
claim 4	4	claim 9	claim 9	claim 15	claim 16	claim 20	claim 21, claim 11, pars. 88 and 90
claim 5	5	claim 10	claim 11	claim 16	claim 17		

Applicant respectfully submits that the present application is entitled to the benefit of the foreign priority date, and that Sasa is not longer prior art. It is therefore believed that the prior art rejections which include Sasa are overcome.

F. Claim Rejections under 35 U.S.C. § 102(b)

Claims 1-4, 6, 8, 9, 14, and 20 had been rejected as being anticipated by Ohkuma (U.S. 5,869,210).

Ohkuma has not been cited to anticipate claim 11. As discussed above, independent claims 1, 18, and 20 have been amended to include the limitations of claim 11. It is therefore believed that the anticipation rejection based on Ohkuma is overcome.

G. Claim Rejections under 35 U.S.C. § 103(a)

After the removal of Sasa as prior art in section F above, the following rejections remain: a) claims 1-4, 6-9, 14, and 16-20 are unpatentable over Korishima (JP 05/046061) in view of Dhar (U.S. 6,482,551); b) claims 1-4, 6-14, and 16-20 are unpatentable over Korishima in view of Hegel (U.S.2004/0002008); c) claims 1-12, 14, and 16-20 are unpatentable over Korishima in view of Dhar (U.S. 2003/0087104); d) claims 1-4, 6-9, 14, and 16-20 are unpatentable over Korishima in view of Dhar '551, and either Gottschalk (U.S. 4,772,541) or Adair (U.S. 4,954,414); e) claims 1-12, 14, and 16-20 are unpatentable over Korishima in view of Dhar '104 and either Gottschalk or Adair; f) claims 1-4, 6-14, and 16-20 are unpatentable over Korishima in view of Hegel and either Gottschalk or Adair; g) claims 1-12 and 14-20 are unpatentable over Korishima in view of Dhar '104, Horimai (WO

02/15176) and either Gottschalk or Adair; and h) claims 1-4 and 6-20 are unpatentable over Korishima in view of Hegel, Horimai and either Gottschalk or Adair.

1. Korishima does not teach or suggest dye/borate photoinitiator

In each of the obviousness rejection, the Examiner cited Korishima to teach a photoinitiator having a dye cation and a borate anion (pars. 6-10 of Korishima). Applicant respectfully disagrees with the Examiner.

The photoinitiator of Korishima contains an ammonium cation, not a dye cation as recited in claims 1, 18, and 20 of the present application. An ammonium cation is not a dye cation.

The difference between various types of cations is described in Adair (Adair has been cited by the Examiner). In col. 4, lines 37-57 of Adair, a photoinitiator having a cationic metal is disclosed. In col. 3, lines 28-33 of Adair, he explains that cationic metal photoinitiators are different than, and superior to, cationic dye photoinitiators. Thus, Adair clearly makes a distinction between cationic dye photoinitiators and cationic metal photo initiators.

In a similar manner, the ammonium cationic photoinitiator of Korishima is not the claimed the cationic dye photo initiator

of Formula (I). Applicant therefore respectfully submits that Korishima does not teach or suggest the cationic dye photo initiator of the claimed invention, and that claims 1, 18, and 20 are patentable over the cited references taken alone or in combination.

2. Dhar '551, Hegel, Dhar '104, Gottschalk, and Adair do not teach or suggest the criticality of employing a photoinitiator of Formula (I)

Dhar '551, Hegel, and Dhar '104 teach the photoinitiator Irgacure 784 (col. 14, line 5 of Dhar '551, par. 36 of Hegel, and par. 91. of Dhar '104). The Irgacure 784 photoinitiator disclosed by these references does not fall within the scope of Formula (I) of claims 1, 18, and 20.

The examples of the present application demonstrate the criticality of employing a photoinitiator of Formula (I) compared to the Irgacure 784 photoinitiator of Dhar '551, Hegel, and Dhar '104. This criticality demonstrates the surprising and unexpected results of the claimed invention.

As explained on pages 44-47 of the application, holographic recording layer forming compositions 1 through 3 each employ Irgacure 784 (see line 7 on page 45, and lines 5 and 20 on page 46). Table 4 on page 59 shows that recording media 1 through 3

and 24 through 26 contain either holographic composition 1, 2, or 3.

In Table 7 on page 65, Comparative samples 1-1 through 1-3 (containing recording media 1 through 3) and Comparative samples 1-4 through 1-6 (containing recording media 24 through 26) received poor sensitivity and poor contrast evaluation results.

In contrast to the comparative samples, holographic recording layer forming compositions 4 through 19 were formed using photoinitiators that fall within the scope of Formula (I) of the claimed invention (see lines 9 and 17 on page 47 of the application).

As shown in Table 4 on page 59, holographic compositions 4-19 were used to prepare recording media 4 through 15. As shown in Table 7 on page 65, Inventive samples 1-1 through 1-12 (having recording media 4 through 15) exhibited superior sensitivity and superior contrast compared to Comparative samples 1-1 through 1-6 employing Irgacure 784.

Applicant respectfully submits that the examples of the present application demonstrate the criticality of employing a photoinitiator of the claimed Formula (I). Applicant also respectfully submits that these results are unexpected, because Dhar '551, Hegel, and Dhar '104 do not teach or suggest the criticality of employing a photoinitiator of the claimed Formula (I). Instead, Dhar '551, Hegel, and Dhar '104 teach using

Irgacure 784, which the examples of the present application demonstrates is inferior to the claimed photo initiator of Formula (I).

Applicant therefore respectfully submits that the present invention is patentable over the combination of Korishima in view of either Dhar '551, Hegel, or Dhar '104.

3. The present invention is not obvious based on the combination of Gottschalk and Adair with the remaining cited references

Claims 1, 18, and 20 of the application recite the combination of 5 elements: a) a binder having a reactive group, b) a polymerizable compound having an ethylenic double bond, c) a photo initiator containing a compound of Formula (I), d) a cross linking agent which reacts with the reactive group in the binder compound, and e) the thickness of the holographic recording layer.

The Examiner stated that it would be obvious to combine the teachings of Korishima with either Dhar '551, Hegel, or Dhar '104, and also with either Gottschalk or Adair to achieve the claimed invention. Applicant respectfully disagrees.

First, as discussed above, Adair teaches a cationic transition metal photo initiator (see col. 4, lines 37-57). The cationic metal photo initiator of Adair is not the claimed

cationic dye photo initiator of Formula (I). In addition, as also discussed above, Korishima teaches an ammonium cation photoinitiator (see pars. 6-10 of Korishima). Thus, a combination of Gottschalk or Korishima with the remaining cited references does not teach or suggest the cationic dye photoinitiator of the claimed Formula (I).

Based on the criticality of employing the claimed photoinitiator of Formula (I) as demonstrated in the examples of the present application, Applicant respectfully submits that it would not be obvious to employ the claimed cationic dye photoinitiator of Formula (I) based on the teachings of Gottschalk or Korishima in combination with the remaining cited references.

Turning to Gottschalk, Gottschalk broadly teaches a cationic dye photoinitiator (see col. 5, lines 24-41). However, Korishima is the primary reference, and Korishima teaches an ammonium cation photoinitiator. There is absolutely no teaching or suggestion in the cited references that the ammonium cation photoinitiator of Korishima is equal to, or can be substituted by, the cationic dye photoinitiator of Gottschalk.

Thus, Applicant respectfully submits that one of skill in the art would not replace the ammonium cation photoinitiator of Korishima with the cationic dye photoinitiator of Gottschalk. It is therefore believed that the claimed invention is not

obvious over the combination of Korishima and Gottschalk with the remaining cited references.

In addition to the above, Applicant notes that the obviousness rejections which include Gottschalk or Adair where not applied against claim 11 (note that the rejections including Sasa have been overcome using applicant's foreign priority document). Thus, since claims 1, 18, and 20 have been amended to include the thickness limitation of claim 11, Applicant respectfully submits that the obviousness rejection which includes Gottschalk and Adair have technically been overcome on their face.

H. Double Patenting Rejection

Claims 1-4 and 8-20 had been rejected for obviousness-type double patenting as being unpatentable over claims 1-16 of co-pending application 11/201,815 in view of Korishima.

Since the '815 application has not yet issued, Applicant respectfully requests suspension of the double-patenting rejection. Applicant will consider filing a terminal disclaimer when the '815 patent issues.

I. Conclusion

In view of the foregoing and the enclosed, it is respectfully submitted that the application is in condition for

allowance and such action is respectfully requested. Should any extensions of time or fees be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit Account # 02-2275.

Respectfully submitted,

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Encl: Certified English translation of priority document